

REMARKS

The Final Office Action dated August 21, 2003, has been received and reviewed.

Claims 1-60 are currently pending and under consideration in the above-referenced application, each standing rejected.

Reconsideration of the above-referenced application is respectfully requested.

Objection to the Drawings

The drawings have been objected to because the Office does not believe that reference character “21” appears therein. It is respectfully submitted that reference character 21 and an appropriate lead line appear in FIG. 1, the FIG. to which reference is made when reference to “notch 21” appears in the disclosure. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

Rejections Under 35 U.S.C. § 102(b)

Claims 1, 3, 12, 13, 16-18, 21, 23, 32, 33, and 36-38 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is assertedly anticipated by that described in U.S. Patent 5,852,497 to Pramanik et al. (hereinafter “Pramanik”).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Additionally, the elements must be arranged as required by the claim, but identity of the terminology is not required. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Pramanik describes a process for locating or identifying conventional alignment marks on a substrate. Col. 1, lines 63-65; col. 10, lines 36-39. The alignment marks that are identified in the process of Pramanik comprise shallow trench isolation (STI) structures that are covered by one or more layers of opaque material. Col. 2, lines 60-63. The process of Pramanik is effected once the substrate has been brought to a desired destination. *See* col. 4, lines 10-26. When the

substrate is at the desired destination and the alignment marks have been located or identified, one or both of the substrate and a reticle may be oriented in such a way that moved to align the substrate and the reticle with one another. Col. 3, line 45; *see also* col. 1, lines 27-30.

Independent claim 1 of the above-referenced application, as proposed to be amended herein, is drawn to a method for identifying a type of semiconductor device being fabricated on a substrate by evaluating mark that comprises at least one recess in a surface of the substrate. The method of independent claim 1 includes, among other things, detecting locations at which an intensity of reflected radiation differs from a substantially baseline intensity and, based upon such differences, correlating locations at which the intensity differs from the baseline intensity to identify at least one characteristic which distinguishes the mark from other marks on or in the substrate and to identify the type of semiconductor device being fabricated on the substrate.

Pramanik lacks any express or inherent description of correlating locations at which an intensity of reflected radiation differs from substantially a baseline intensity to identify at least one characteristic which distinguishes a mark from other marks or features on or in a substrate. In Pramanik, the configuration of the alignment mark is already known; thus, there is no need for the method of Pramanik, which is limited to detecting edges of alignment marks, to include correlation of locations at which an intensity of reflected radiation differs from substantially a baseline intensity to identify at least one characteristic of a mark which distinguishes that mark from other marks on or in the substrate.

Additionally, Pramanik does not expressly or inherently describe that the at least one distinguishing characteristic may be used to identify a type of semiconductor device being fabricated on the substrate. The sole result of the process described in Pramanik is to finely align an already roughly positioned substrate.

Therefore, Pramanik does not anticipate each and every element of amended independent claim 1. Accordingly, under 35 U.S.C. § 102(b), independent claim 1 is allowable over Pramanik.

Claims 3, 12, 13, and 16-18 are each allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Independent claim 21 recites a method for determining a destination of a semiconductor device substrate. That method includes identifying a mark that comprises at least one recess within a surface of the semiconductor device substrate, which mark is covered with at least one layer of material. Such identification includes scanning electromagnetic radiation over a plurality of locations of the substrate, detecting locations at which an intensity of the electromagnetic radiation changes from substantially a baseline intensity, and correlating each such location to identify the mark. Once the mark has been identified, a predetermined destination for the substrate may also be identified.

The description of Pramanik is limited to finely aligning a semiconductor device substrate that has already been roughly positioned at a desired destination. *See* col. 1, lines 27-30. Pramanik includes no express or inherent description of identifying a mark, then identifying a predetermined destination for a semiconductor device substrate based on an identity of the mark.

Therefore, Pramanik does not anticipate each and every element of independent claim 21. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 21 is allowable over Pramanik.

Each of claims 23, 32, 33, and 36-38 is allowable, among other reasons, as depending either directly or indirectly from claim 21, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 102(b) rejections of claims 1, 3, 12, 13, 16-18, 21, 23, 32, 33, and 36-38 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 2-11, 14, 15, 19, 20, 22, 24-31, 34, 35, and 39-60 stand rejected under 35 U.S.C. § 103(a).

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference

(or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Pramanik

Claims 2, 6-11, 14, 15, 22, 26-31, 34, and 35 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is purportedly unpatentable over that taught in Pramanik.

Claims 2, 6-11, 14, and 15 are each allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Claims 22, 26-31, 34, and 35 are each allowable, among other reasons, as depending either directly or indirectly from claim 21, which is allowable.

Pramanik in View of Bareket

Claims 4, 5, 19, 20, 24, 25, and 39-58 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is asserted to be unpatentable over teachings from Pramanik, in view of the teachings of U.S. Patent 5,889,593 to Bareket (hereinafter "Bareket").

Bareket describes an optical system and methods. The optical system of Bareket includes an angle-dependent reflectometer with multiple detection elements for detecting radiation which is reflected at different angles. In addition, that system includes a processing system that acquires and analyzes data of the detected, reflected radiation. The system of Bareket is useful for optically inspecting semiconductor wafers, including the widths of conductive lines (or "periodic text patterns") on the surfaces of the semiconductor wafers.

Like Pramanik, Bareket lacks any teaching or suggestion of a method that includes identifying a type of semiconductor device being fabricated on a substrate by evaluating mark that comprises at least one recess in a surface of the substrate, as recited in independent claims 1 and 21, or identifying a destination for a semiconductor device substrate based upon an identity of a marking thereon, as recited in independent claim 21.

Pramanik and Bareket likewise lack any teaching or suggestion of a system that includes at least one processor that analyzes "a pattern of intensities of electromagnetic radiation of said at

least one wavelength reflected from a plurality of locations of [a] substrate and [that correlates the] pattern of intensities to a known identifier associated with [a] marking and to the type of semiconductor device being fabricated on the substrate,” as recited in independent claim 41, as amended and presented herein.

Accordingly, it is respectfully submitted that neither Pramanik nor Bareket, taken either separately or together, teaches or suggests each and every element of any of the claims of the above-referenced application.

Moreover, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of Pramanik and Bareket in the manner that has been asserted. Because Pramanik and Bareket lack any teaching or suggestion of a method that includes identifying a type of semiconductor device being fabricated upon a substrate, it is respectfully submitted that any motivation to combine the teachings of these references in such a way as to render such a method obvious could only have been improperly based on the hindsight provided by the disclosure of the above-referenced application.

For these reasons, it is respectfully submitted that Pramanik and Bareket do not support a *prima facie* case of obviousness under 35 U.S.C. § 103(a) against any of the claims of the above-referenced application.

In any event, claims 4, 5, 19, and 20 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable, while claims 24, 25, 39, and 40 are each allowable, among other reasons, as depending either directly or indirectly from claim 21, which is allowable.

Claims 42-58 are each allowable, among other reasons, as depending either directly or indirectly from claim 41, which is allowable.

Bareket in View of Pramanik

Claims 59 and 60 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bareket, in view of Pramanik.

Independent claim 59, as proposed to be amended, recites a processor for characterizing at least one material-covered recessed marking formed in a substrate and a type of semiconductor

device being fabricated on the substrate. The processor of amended independent claim 59 includes at least one logic circuit for comparing a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate, as well as at least one logic circuit for mapping a plurality of locations of said substrate where said measured intensity differs from said baseline intensity. The resulting map comprises a digital image of the recessed marking. The processor of amended independent claim 59 also includes at least one logic circuit for identifying a type of semiconductor device that corresponds to the mapped locations.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against amended independent claim 59 for at least two reasons.

First, it is respectfully submitted that neither Bareket nor Pramanik teaches or suggests a processor which is capable of mapping data of radiation which is reflected from a substrate in such a way as to generate a digital image of a recessed marking formed in the substrate. Rather, the teachings of Bareket are limited to recognizing periodic text patterns (*i.e.*, the periodicity of conductive lines along a substrate), while the teachings of Pramanik are limited to recognizing the locations of edges of alignment marks.

Even assuming, for the sake of argument, that either Bareket or Pramanik teaches or suggest a processor which is capable of mapping data of radiation reflected from a substrate, neither of these references teaches or suggests a processor which includes a logic circuit for identifying a type of semiconductor device to which the mapped locations correspond.

Second, since neither Bareket nor Pramanik teaches or suggests a logic circuit which is configured to map a plurality of locations on a substrate where a measured intensity differs from a baseline intensity to generate a digital image of a recessed marking formed in the substrate, neither of these references could motivate one of ordinary skill in the art to develop a processor with such a logic circuit.

Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), amended independent claim 59 is allowable over the combination of Bareket and Pramanik.

Claim 60 is allowable for depending from claim 59 and, further, because neither Bareket nor Pramanik teaches or suggests a processor which includes at least one logic circuit which

“characterize[es] . . . at least one material-covered recess based on [a] plurality of locations [that have been] mapped . . .”

For the foregoing reasons, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 2-11, 14, 15, 19, 20, 22, 24-31, 34, 35, and 39-60 is respectfully requested.

ENTRY OF AMENDMENTS

It is respectfully submitted that the claim amendments that have been proposed herein should be entered since they do not introduce new matter into the above-referenced application and should not require that an additional search be performed. If the proposed claim amendments are not entered, entry thereof upon the filing of a Notice of Appeal in the above-referenced application is respectfully requested.

CONCLUSION

It is respectfully submitted that each of claims 1-60 is allowable. An early notice of the allowability of each of these claims and an indication that the above-referenced application has been passed for issuance are respectfully solicited. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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